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ABSTRACT
It is assumed here that the most effective way of reducing the rate of deviant child behavior is to alter the reinforcing contingencies supplied by the social agents who live with the child. The immediate focus for the intervention program is upon the social environment in which the child lives, because it is the parents, siblings, peers, and teachers who provide the reinforcers which maintain these behaviors. Data are presented in this report from observations made for six children demonstrating the effect of direct intervention in the home and in the school. The sample consisted of boys aged four-12, with multiple problems of the kind typically referred for outpatient treatment. Observations made during baseline, intervention, and follow-up underline the feasibility of training parents, siblings, peers, and teachers to alter the behavior of the identified deviant child. (BP)

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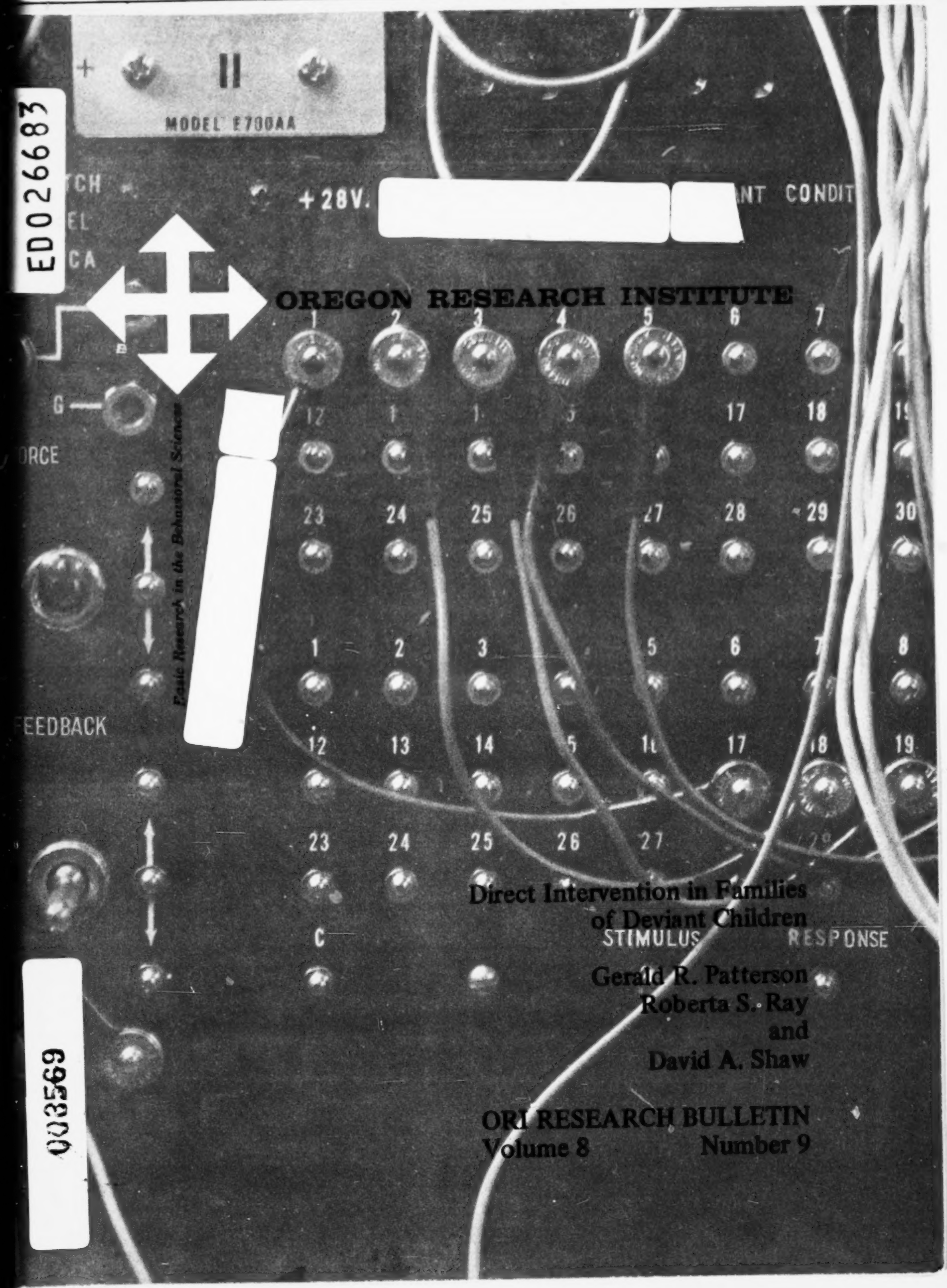


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# DIRECT INTERVENTION IN FAMILIES OF DEVIANT CHILDREN[1]

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## Abstract

Data are presented from observations made for six children demonstrating the effect of direct intervention in the home and in the school. The sample consisted of boys with multiple problems of the kind typically referred for outpatient treatment. Observations made during baseline, intervention, and follow-up underline the feasibility of training parents, siblings, peers and teachers to alter the behavior of the identified deviant child.

# DIRECT INTERVENTION IN FAMILIES OF DEVIANT CHILDREN[1]

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It is assumed here that the most effective way of reducing the rate of deviant child behavior is to alter the reinforcing contingencies supplied by the social agents who live with the child. Within this context the proper focus of attention for the behavior modifier is the parents, siblings, teacher, and members of the peer group. Once the behavior of the "dispensers" is altered, they in turn will alter the behavior of the deviant child. Presumably the outcome of such a process would be to accelerate the alteration of the deviant behavior, maximize the generalization across settings, and increase the persistence of the behavior change. The present report outlines some preliminary procedures for reprogramming the environment in which the deviant child lives.

The immediate focus for the intervention program is upon the social environment in which the child lives, because it is the parent, the siblings, peers, and teachers who provide the reinforcers which maintain these behaviors. The assumption is that many (not all) deviant child behaviors are acquired and maintained as a function of positive social reinforcers supplied by these agents. There are a number of studies which provide observation data showing that reinforcing contingencies are provided by the peer group for a wide variety

of deviant child behaviors including aggression (Patterson, Littman, & Bricker, 1967), delinquency (Buehler, Patterson, & Furness, 1966), and disruptive classroom behaviors (Anderson, 1964; Ebner, 1967). The data collected thus far show that even mothers provide reinforcers for deviant behavior (Hawkins, Peterson, Schweid, & Bijou, 1966; Jones, 1965; Wahler, 1968).

The existence of a social environment which is quite "irrational" in supplying social reinforcers for deviant behavior poses a problem in conceptualizing the generalization and persistence of intervention effects. For, while the generalization of effects necessarily varies as a function of the similarities in stimulus properties of the settings, it is unlikely that such stimulus control is of much importance beyond the first few responses emitted by the child. If the mother continued to reinforce the deviant behavior, the change in deviant behavior at termination of intervention would be short lived indeed. It seems that in considering intervention, the generalization and persistence of effects are less a matter of stimulus generalization (mediated or otherwise) and more a function of reinforcement control. Thus, the most efficient focus of intervention programs should be the alteration of the social system within which the child responds.

Efforts to devise intervention programs for deviant children, in other than the institutional settings have involved techniques for training the parent almost from their inception. Allen and Harris (1966), Bernal, Duryee, Pruett and Burns (1968), Hanf (1968), Patterson (1965b), Patterson and Brodsky (1966), Reid (1967), Straughan (1964), Wahler,

Winkel, Peterson, and Morrison (1965), and Wolf, Mees, and Risley (1964), attempted to train the parent in the clinic or laboratory. Lindsley (1966), Ray (1965), and Walder, Cohen and Daston (1967) attempted to use group training procedures with parents to apply behavior modification principles to altering deviant child behaviors. More recently, several groups of investigators have carried out the training procedures in the homes of families (Hawkins et al., 1966; O'Leary & Becker, 1967; Patterson, McNeal, Hawkins, & Phelps, 1967; Shah, 1967; Zeilberger, Sampen, & Sloane, 1968). In these studies, the parents were trained to use social and non-social reinforcers to strengthen some set of socially adaptive behaviors. They were also trained to either ignore deviant behaviors, or to apply some mildly aversive consequence such as "time-out." By implication, these studies constitute the crude beginnings of a systems approach to intervention in their emphasis upon the reinforcers which maintain the behavior not only of the deviant child but the behavior of the dispenser as well. In most of the studies, it is implied that the reduction in rate of deviant child behavior is analagous to the withdrawal of an aversive stimulus and, thus, reinforces the parents for participating in the program. However, some studies have identified parents for whom alterations in child behavior was not a reinforcer and necessitated providing external reinforcements to maintain the behavior of the parent such as money (Patterson et al., 1967) or trips to the hairdresser (Patterson & Reid, 1969). As behavior modification techniques are applied to an increasing range of problems it is likely that such "unmotivated parents" will

constitute a major problem in planning intervention strategies. This, in turn, will very likely necessitate more sophisticated techniques for altering the family system. The present report does constitute an attempt to develop intervention procedures appropriate for a range of multiple problem cases drawn from all socio-economic levels in the community. In several instances the magnitude and complexity of these problems coerced the writers into adopting a systems approach in which programs were developed which provided unique reinforcing contingencies for the parent as well as the child.

The intervention programs are described for six boys whose "problem behaviors" ranged from withdrawal, isolation and school failure to tics, hyperactivity, extreme aggression and burning cars. The intervention programs were designed to fit each child. In some instances there were separate programs for the home and the shcool. Observation data are provided which demonstrate the effect of these programs at termination and over a follow-up period.

## Procedures

### Overview

Each of the six families was referred to the project for treatment of a "psychiatric disability" of one or more members of the family and represented examples of severe conduct disorders. The deviant boys were between the ages of four and twelve. The families sampled all socio-economic levels of the community. The referrals were usually made by a staff member of one of the local agencies or by a physician concerned with mental hygiene problems.

Following a referral the parents and children came into the laboratory for an initial interview to determine the nature and extent of the problem. The child was also observed in a standard clinical intake situation. These data plus the parents' listing of referral problems were combined to provide a descriptive profile of the child's behavior (Patterson, 1964).

During the baseline period each family was observed in the home for ten sessions. If the child was having difficulties in the school, he was also observed in that setting. Following the collection of these baseline data the intervention programs were initiated in the home and in the classroom. The programs required from twelve to sixty hours of professional time and ranged from one to twenty weeks in duration. Observation data were collected during the intervention program and for a six month follow-up period in both the classroom and the home.

## Intervention Programs

The intervention programs used with the families have evolved gradually, beginning with the first attempts in 1966 through the present time. Development of an observation system for coding family interaction was begun in 1967. At that time an attempt was also made to develop a general sequence of procedures which could be applied to families requesting outpatient services for deviant children.[2] These intervention procedures included four different phases. First the parents were trained to use the language and concepts of social learning. This training was provided by a programmed textbook developed

for this purpose (Patterson & Gullion, 1968). The textbook outlines some general principles from reinforcement theory, as well as their application to a range of problem child behaviors. The parents were then trained to observe and count child behaviors. Following this, the entire family participated in a series of "sample" intervention programs which were first modelled by the experimenters and then imitated by the family members. These programs were designed to either reduce the reinforcement being provided for deviant behaviors or increase the reinforcement being supplied for socially adaptive behaviors. As the last phase the family members practiced these specific programs when the experimenters were not present.

The classroom procedures consisted of two rather general approaches. One approach involved the use of peer-teachers to train the deviant child in either academic or social skills. The other involved the training of "attending" or "work" behaviors in the classroom and the concomittant reduction in rate of disrupting or non-attending behaviors.

The techniques for intervention in both the home and the classroom are of course still in the process of development. The studies are described in the sequence in which they were carried out and presumably portray increasing levels of sophistication and competence.

## Observation

Home. The baseline data were collected during ten observation sessions spanning a two-to-three week period. Follow-up data were collected over a period of six months with two observation sessions each month. The observations were made at approximately the same hours each day, gen-

erally in the early evening when the entire family was present. During the observation period, the members of the family were required to interact in the kitchen and an adjoining room. This structuring was introduced when it became obvious that in some families people "hid" from the observers by staying in the bathroom, working in the yard, or reading in their bedrooms. Later in the series it also seemed necessary to introduce a further element of structuring and require that the television set remain off throughout the observation session. This latter requirement was introduced beginning with the families of Walter and Keith.

A system for the coding and recording of social behaviors is elaborated in the observation manual (Patterson, Ray & Shaw, 1968). The code is made up of 29 behaviors, operationally defined and sufficiently inclusive to provide a classification scheme for most of the social behaviors which had occurred in families previously observed. Among the categories are such behaviors as talk, work, attend, ignore, command, compliance and non-compliance, positive and aversive physical contact, play, self-stimulation, disapproval, and dependence. In essence, the task of the observer using this system is to characterize each interaction by coding the behavior of the subject and the consequence(s) provided for that behavior by other members of the family.

Each of the observers was equipped with a clipboard containing an interval timing device which emitted an auditory stimulus (via earphone) at thirty-second intervals. At each thirty-second signal the observer began recording behaviors on the next line of the behavior coding sheet.

Pacing the observers in this way provides a fine grain estimate for the rate of occurrence of the behaviors.

Ten thirty-second intervals of observation made up each five-minute block. During each five-minute block, a single family member was specified as the subject. The observer then recorded all of his behaviors and the consequences provided for those behaviors by the other members of the family. During the next five-minute block the observer similarly coded the behavior and consequences for the next family member designated as the subject (by random ordering of names) and so on until each family member had been the designated subject of two five-minute blocks of observation. Thus, for a six-member family, an observation session was completed in one hour.

School. The baseline observation of school behavior usually took about two weeks. An attempt was made to obtain a reliable sample of the subject's behavior in an individual work setting and in a group instruction or activity setting. Where possible additional observations were made of the subject's behavior during unstructured recess periods.

A school observation manual (Ray, Shaw, & Patterson, 1968) explains the coding system and gives operational definitions of the behaviors coded in classroom observations. As in the family interaction observations, the observer was equipped with a clipboard and attached interval timing device which emitted an auditory signal via an earphone. The data were collected at fifteen-second intervals. The observers noted the subject's behavior during each interval and the consequence supplied by either the teacher or peers. The codes described both deviant and

adaptive classroom behaviors, including inappropriate noise or talking, aggression, not attending, movement about room, movement in chair, self-stimulation, appropriate talking, reciting, volunteering to participate and appropriate initiations to the teacher. The coding of one of these behaviors was followed by a code to indicate the consequence of the behavior and a code to indicate the agent (teacher or peer) providing the consequence. These included attention, no response, praise, compliance, non-compliance, positive or aversive physical contact, and disapproval.

On each occasion that a subject was observed in the classroom, similar observations were made of other "normal" boys in the classroom and their rate of deviant behavior averaged to provide an estimate of the "acceptable level of deviant behavior" for that situation.

Observer reliability. Observers were trained in a program which included reading of the coding manuals, observation and coding of standardized practice films depicting family and classroom interaction, and actual practice sessions in homes and classrooms with reliable observers who served as trainers. On occasions when reliability data were collected in the home or classroom by two observers, the interval timing devices were synchronized.

In the case of home observation data, observers were required to agree both in code categories and in sequence of codes recorded during each thirty-second interval. Using this stringent requirement as a criterion for reliability, the median percentage agreement among five trained observers was 83.5.

In the case of classroom data, rank order correlations of observa-

tion category frequencies between observers yielded a median reliability coefficient of .92 among five observers.

## Interventions

The procedures and data will be presented for each of the families in the order in which they entered the project.

### The J Family

John was a four year old boy referred by the Child Welfare Department because his mother could not control his behavior. He had three or four temper tantrums each day. He was described as being generally very hyperactive, negativistic and was thought to be mildly retarded. Frequent spankings had not been effective. Recently he had begun to steal candy and trinkets from stores.

The family consisted of a six year old brother, a three year old sister and the mother. The mother and father had been separated; and the family was now supported by the Aid to Dependent Children Program. The mother was twenty-three years of age, and had a tenth grade education. She was distraught, and eager to see some changes made. Her personality profile code from the Minnesota Multiphasic Personality Inventory (MMPI) was 8476'2319(45)6:14:11.

Following the baseline observation in the home Mrs. J was given an earlier version of the programmed textbook on social learning which had been written for parents. As soon as she indicated that she had completed most of the material, the investigators went to her home and reviewed with her the problem behaviors which she wished to change. She listed his extreme negativism, temper tantrums and hitting as being

her primary concerns. She also said she would like to change his getting up early in the morning while the rest of the family was asleep and creating chaos in her kitchen. He would empty out the drawers, take food, and make messes on the floor.

Intervention. In the first session a series of situations were created in which E repeatedly made requests of John. For example, E asked, "Please pick up that magazine over there and bring it to me." As John looked toward the magazine, E said, "Good, he is going to help me," and dropped an M&M candy into the dish. "He has already earned one M&M. Let's see how many he can earn. We are going to divide them all up when he is done working today." As John walked across the room, E continued to dispense both social and non-social reinforcers. As John returned with the magazine, the mother and siblings became involved and "cheered him on." The whole family then participated in suggesting requests to which he complied.

The first forty-minute practice session had very much a "game quality" to it. The candies were divided among all of the children, and arrangements made for the mother to hold regular practice sessions throughout the day. In these sessions, he was to earn points for all of the children in the family. These points could purchase trinkets and toys from a supply which E showed the children. Non-compliance with requests was to be ignored.

In the same session a series of two or three situations were created in which John was to play with his siblings. At intervals E said, "That's very good; you have been playing now for several minutes and you have not

been fighting. That is worth a point." These points were also traded in at the end of the session for M&M candies. The mother was to note any situation during the day in which John played with his brother and sister without fighting. Such incidents would contribute points to the commonweal.

The next day E returned to the home and provided the back-up reinforcers earned by John during the past twenty-four hours. The mother announced that the practice sessions had gone extremely well and there had been almost no fighting or non-compliances. The children were delighted with the toys earned by John's efforts.[3]

An arrangement was then introduced to alter the occurrence of the early morning forays. John was given an electric clock which was placed by his bed. In the practice sessions with E, the boy pretended to wake up early in the morning. He then reached over, activated the clock, and remained in bed. For each two minutes that he remained in bed he earned an M&M; he was told that if he "cheated" he would lose points.

On returning the following day to provide the back-up reinforcers for points earned, E discovered that the clock procedure had not effectively controlled John's behavior. John, his bed, and the clock were then moved into the mother's bedroom for a few days so that she could monitor his accurately recording "time in bed."

On the occasion of each visit, E continued to practice the compliance and non-fighting interactions and discussed any problems which the mother might have had in her practice sessions during the day.

During the third and fourth sessions E introduced one further train-

ing procedure. The mother's "No" had little control over John's behavior and in general the mother seldom provided any clear-cut consequences contingent upon either compliance or non-compliance with such a command. E arranged a series of practice sessions in which John was reinforced for compliance with "No," For example, as John walked toward the door, E said, "No, John, you can not go outside." As John turned around, E said, "very good, that is certainly worth a point." Several dozen such trials were carried out each day by both E and the mother. She also carried out several practice trials during the day.

After a series of four training sessions, the mother reported marked changes in John's behavior. As she continued to supply positive reinforcers for adaptive behaviors, she was increasingly effective in controlling his behavior. During the one month of follow-up, she reported few temper tantrums and no instances of stealing or early morning assaults on the kitchen. At this point the family moved to another community so that the mother could be close to one of her relatives. No further data were collected.

The data in Figure 1 show the changes in rate of occurrence of John's "out of control behaviors." The incidence of the following behaviors were summed to provide an overall estimate of the following deviant behaviors: yelling, stomping, non-compliance, negativism, hitting, crying, destructiveness, teasing, and ignoring others.

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Figure 1 about here

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The slight increase in deviant behavior during baseline is not statistically significant, but the data showed that there was an average reduction in rate of deviant behaviors of 64 percent from the baseline to that obtained during the one month follow-up, a change which is significant at the .05 level. Systematic data were not collected on such low base rate events as "stealing" or "high amplitude aggression," but the mother's reports indicated that these behaviors now occurred seldom, or not at all. These changes were brought about by an investment of 9.8 hours of professional time. The latter includes the time required for intake interview, staff conference, telephone calls, transportation, and actual time in the home. On those occasions where more than one staff person was involved the time invested was counted double. The estimate does not include the time required to collect observation data.

The staff had not been prepared for the rapid alterations in deviant behavior and, therefore, had collected no data during intervention. However, there was an even more glaring omission in this study. To establish the utility of intervention procedures, it is necessary to provide data which, not only demonstrate alterations in child behavior at modest investments of professional time, but in addition demonstrate that the effects persist for at least six months. As these data were not available in the study, it was decided to replicate with a child of approximately the same age who would present similar behavior problems.

It was also decided to tighten up the parent training procedures.

For example, effective child management presupposes that the parents accurately observe both the child's behaviors and the reinforcing contingencies which maintain these behaviors. This being the case, then the first step should consist of training parents to observe. It was also decided that provisions should be made for a greater frequency of parent practice sessions. In order to facilitate this it was decided to space the intervention sessions in the home and to use intensive "telephone supervisions" between sessions.

The fact that these innovations were made does of course mean that the following study was more an extension of the procedures used with the J family, rather than a replication.

The R Family

Russ was a six year old boy referred by the family pediatrician because of a wide range of deviant behaviors. He was said to be extremely aggressive to his three year old brother, initiating several fights per day. He did not comply with requests made by his parents. He refused to dress himself, to tie his shoes, or even to wipe himself after a bowel movement. He was also described as very nervous and suspicious of adults and frequently stated that nobody liked him. He often walked about muttering to himself, "I hate, I hate." He did not get along with other children. The pediatrician felt that he would not be able to enter school in the fall because of his "immaturity" and "emotional problems."

Both parents had completed a high school education. The father worked as an unskilled laborer in the local plywood mill; the family

lived in an attractive home in the country. The MMPI profiles for the the father and mother were respectively 9'467813(49)4:4:13 and 7'23684 (40)2:4:14. Both parents described themselves as being "yellers" and as using highly punitive techniques for controlling the behavior of both of their children. The baseline observations corroborated these statements in showing a rather low incidence of positive consequences and relative reliance upon aversive stimuli for behavior control.

Intervention. The parents read the core section of the programmed textbook which outlined general reinforcement and extinction concepts, as well as the chapters which described the contingencies controlling the behavior of the Negativistic Child and the Aggressive Child. These chapters also described the procedures which had been used with previous families to alter these child behaviors.

After both parents indicated that they had responded to these materials, the investigators arranged for an office interview in which the child's problem behaviors were pinpointed.[4] Each of the parents agreed to observe Russ for one hour a day. They were to record the incidence of each of the following behaviors: hitting, pushing or shoving his younger brother, non-compliance with parental requests and commands, refusal to wipe himself after going to the toilet, failing to dress himself. The parents were also to record the consequences provided for each of these behaviors. As all of these behaviors were low rate responses, it was deemed possible to have them also count the number of positive social reinforcers which they used in interacting with Russ.

A telephone call two days later revealed that both of the parents had been very conscientious in collecting all of the required data. They were told that if they could continue to observe this carefully for another two days the investigators would come to their home and initiate the behavior change programs.

During the first training session in the home, a series of practice trials was initiated by E with both of the boys earning points and social reinforcers for compliance with requests and commands. The parents also carried out several practice sessions while E supervised. That first evening Russ earned 30 M&M candies and his brother 6. The parents agreed to carry out regular practice sessions for compliance in which Russ and his brother earned points. The parents were also instructed to continue collecting the observation data on the full array of behavioral events. The telephone follow-up the next day revealed that Russ had earned 25 points and his brother 23. The mother noted that Russ had partially wiped himself following a bowel movement. She had, on her own initiative, decided to give points for this behavior also. During the week, they continued to earn about 25 points per day; the back-up reinforcers for these points consisted of M&M candies and plastic trinkets which had been left with the parents. The mother felt that the behaviors were coming under control.

In the second training session in the home, procedures were introduced to train Russ for compliance with requests which usually produced temper tantrums. The parents were shown, for example, how to reinforce him as he learned to button his shirt and to tie his shoes. Russ was

given a great number of social and non-social reinforcers (50 points) as he practiced. The follow-up telephone calls over the next few days suggested that these programs were working very well. Without assistance from either parent, he continued to wipe himself. While Russ's general compliance was improving, the mother's data showed that he still had as many as seven non-compliances during a day and his rate of hitting was actually increasing.

At the next, and last, family training session the parents were instructed in the use of time-out as a contingency for the hitting behaviors and in training Russ to completely dress himself. More recently, the carefully controlled studies carried out by Wahler (1968) and by Walker, Mattson, and Buckley (1968) showed that the use of time-out contingencies might well be a necessary feature of attempts to control the behavior of children with severe conduct disorders. As used in the present study, either hitting or refusal to dress himself would lead immediately to a five-minute interlude of isolation in the bathroom.

Follow-up telephone calls revealed that Russ initially spent many sessions in time-out. However, over the next week, the parent data showed that he was dressing himself without assistance and his non-compliance had dropped very close to zero. It was decided with the parents that there was no further reason to continue, but that they could contact the project at any time in the future that Russ might have a problem.

The data in Figure 2 are a summary of the same out of control behaviors used for the J family. The data were collected by the observers

during baseline, intervention, and follow-up.

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Figure 2 about here

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These data showed that there was a 62 percent drop in the rate of out of control behaviors from the baseline to the end of follow-up. As with the data presented for John the slope of the baseline for Russ is significant but the difference between levels of deviant behavior exhibited in baseline and in follow-up reaches the .05 level of statistical significance. The family was also much less reinforcing of deviant behaviors as indicated by a drop from .21 deviant responses positively reinforced during baseline (for Russ) to .00 reinforced during intervention. The total investment of professional time amounted to 12.7 hours. During follow-up the mother was observed to be using time-out on several occasions when the behavior of either boy was out of control. She reported that Russ had had no particular problems in adjusting to school.

These very encouraging results suggested that perhaps it was feasible now to attempt to work with more severe cases of multiple problem families. The next two cases were solicited from the juvenile court and mental hygiene clinic.

The K Family

Knute was an eleven year old boy referred by the mental hygiene clinic. His case file constituted an almost complete glossary of deviant behaviors found in child psychiatry. He had suffered the misfortune of being diagnosed as brain-damaged when only three or four years

of age.[5] This label in conjunction with his hyperactivity, lack of speech, and aggressiveness led to his receiving intensive psychiatric treatment for a number of years together with his father and his grandmother. Although the father and the grandmother received intensive training in the use of psychiatric language, there was little change in Knute's behavior.

At nine he was referred to a facility designed for intensive treatment of physically handicapped children. However, after a short time, he was asked to leave that facility because he was hyperaggressive and intractable in the classroom. Several fires set in the school building added to his reputation.

A short time prior to this the father remarried and removed Knute and his ten year old brother from the grandmother's home and brought them into the new family. The mother had also previously been married and brought two younger boys into the marriage. Early in the marriage both parents involved themselves in psychotherapy. They were concerned about the father's tendencies to be "perfectionistic" as well as Knute's facial tic and such bizarre behaviors as striking his grandmother in the stomach, setting fires, and spreading feces on the wall of the bathroom. When the therapist suggested to them that Knute required firm handling and a well-structured environment, the parents withdrew from that agency and were later referred to the project.

At this point the public school system had been coerced into a reluctant acceptance of this boy but allowed him to remain in the school for only one or two hours per day and the remainder of the time was spent with a special teacher who came to his home. He was adjudged as too

disturbed and/or brain-damaged, to be able to tolerate the pressures of school routines.

Mr. K, who was in his mid-thirties, had had several years of college and was now working as a skilled laborer. His wife, also in her mid-thirties, had completed college and worked as a librarian. Their coded MMPI profiles were respectively: 17'63284(31)3:4:16 and 32(34) 4:3:10.

Intervention. Following the collection of the baseline data in the home, both of the parents were given the programmed textbook to read and the MMPI to complete. It required five weeks of agonizing on the part of the father before he completed his responses to both of these tasks. And then because they were remodelling their home, there was a further delay in beginning the intervention program. In an interview carried out during this interim the parents reported that they had used the ideas and procedures from the textbook with gratifying results. They claimed to be less critical of the children, and to have used time-out procedures rather than beatings in controlling such behaviors as fighting. They also felt that they were using much more social reinforcement than they had previously. The observation data collected during this time seemed to corroborate these claims in that Knute's rate of facial tics had dropped from a baseline mean of.63 responses per minute to almost zero and the summed "out of control" behaviors had dropped from .14 to .07 responses per minute.

Over the next few weeks the parents continued to feel they had made substantial progress in that Knute had not exhibited any further bizarre behaviors, nor had he been lighting fires; however, they con-

tinued to have problems in handling some specific behaviors such as going to bed.

In spite of these changes the father continued in his belief that Knute was "really" brain-damaged and, therefore, still had the "potential" for initiating catastrophies. As a result of this belief, innocuous behaviors became discriminative stimuli with the label "incipient bizarreness." Behaviors which produced such labels would in turn lead to long discussions between father and son about the dynamics involved in this latest proof of Knute's brain-damaged condition.

The data also showed that the increase in control over deviant behavior was achieved by the systematic use of time-out as a substitute for the previous unsystematic use of aversive consequences. Periodically, the father would forget to use time-out as an aversive consequence and resort to using his belt to correct behavior. This too would be followed by interchanges in which he sat with his arm about Knute's shoulders interpreting the feelings of both Knute and himself. However, there was little use made of positive social reinforcers to shape adaptive behaviors. While a family system characterized by a father who utilized primarily aversive consequences would not necessarily produce future increases in deviant child behavior it was of some interest to determine whether the father could be trained to alter his despotic mode of interacting with children. Both parents indicated great interest in making the attempt.

It was decided to first provide the father and other members of the family with practice in dispensing positive reinforcers to control

behavior. First, the parents collected several days of observation data on the number of commands required to get Knute to bed. Following this, a conference was held in the home with the entire family present. In this program, Knute could earn up to 30 points for going to bed immediately on any single evening. The parents dispensed the points. After some discussion it was agreed that 200 points would earn a fishing trip with his father.

Telephone follow-up over the next few weeks indicated that the program was working well. Knute earned the points necessary for the fishing trip in about two weeks.

The next step in the program was also presented in a conference with all family members present. Each day one of the older children was to "observe the father." On any occasion that the father reinforced another family member the observer recorded this event on his wrist counter, and if possible made an appropriate comment to the father. Practice sessions were held during the family conference to train the children to accurately discriminate among positive, aversive and neutral consequences. It was agreed that 350 points would earn a steak dinner for the father and mother; the expense would be met by the project funds. The whole family, with the notable exception of the father, was very enthusiastic about this procedure. Telephone follow-up indicated that the father was earning a steady "salary" of 20 to 30 points each day.

A series of conferences were arranged with the teacher, principle, parents and school counselor in order to return Knute to his peer society at school and to desensitize this conclave of grownups to Knute's

presumably brain-damaged behavior. Knute was returned to school and involved in normal classroom routines. With the exception of "the great carrot incident," there were no particular problems. Knute threw a carrot at another child in the lunchroom which through some complex logical process led the school counselor to recall that Knute was brain-damaged. It was necessary to arrange another conference in order to desensitize all of the adults concerned to this label. Again they were encouraged to apply contingencies to Knute's behavior.

In spite of the 350 or more practice trials and the consequent steak dinner, it was apparent that the father was inept in his use of social reinforcers. His mandarin style of interacting with the family was characteristically cool, impeccable, and stern. His standard reinforcer was a curt "Thank you," but often he would follow such a polite interchange with crushing criticism and ridicule.

The father seemed preoccupied and on edge most of the time and described himself as generally like this. It also seemed that he was most likely to use aversive consequences when tense. Although it was decided to desensitize him to some of the situations which produced this tension, it proved difficult to maintain his behavior in the program so it was discontinued. It was suggested instead that the father reduce the number of job committments which he had and that he take a half an hour each evening to relax. He was encouraged to "turn himself off" for thirty minutes prior to dinner, during which time he was to cease to be responsible for the world and listen to his phonograph. His wife helped by providing some stimulus control (keeping the children

out of the room at first) and reinforcing him for "cutting down."

In spite of these maneuvers, the father remained a master of the dinner table lecture, the cutting remark, and the use of commands. For example, 10 to 50 percent of his interchanges with the children consisted of commands! He seldom reinforced for compliance but was irrascible if the child did not comply.

After a conference with the parents, a tape recorder was sent home with them, and the device was turned on during the dinner hour. The father brought the tape to the laboratory on the following day. One of the experimenters spent some time listening to the tape and marking episodes where the father neglected to use positive reinforcers, or interchanges in which he used aversive consequences. In an interview on the following day the father was exposed to thirty such examples from his own tape. First he was asked to identify the behavior in question, then to offer an alternative behavior for each situation. He was reinforced by E for verbalizing the alternative and for providing additional ones. Two more such training sessions produced marked alterations in the behavior of the father.

Telephone calls over the next week indicated that the father was continuing to practice "turning himself off" in the evening; the mother reported that he was much more reinforcing and less punishing in his interactions with the children. An observation in the home indicated that these changes had indeed occurred. The observations during the follow-up period indicated that the father had reduced his rate of commands to about .06 per minute and the rate of disapproval, humiliating,

and ignoring as consequences for the children's behaviors had also dropped considerably.

The observers reported that during the follow-up observations, there would be an occasional "bad evening" during which the father would pounce on Knute, or one of the other boys, and scold or ridicule; but the rate and intensity of these interchanges were much lower than they had been. They also reported that he seemed to retain some skill in using positive social reinforcers.

The rate of out of control and tic behaviors for Knute remained consistently low throughout the six month follow-up as show in Figure 3.

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Figure 3 about here

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Again the changes seen in Knute during the baseline period do not reach statistical significance, although there is a trend which suggests that his deviant behaviors were increasing. The changes effected through the intervention program, however, represent a decrease in deviant behavior which is significant at the .01 level.

Our interest in the "preventative" aspects of this family cost us dearly as shown by the output of 46.7 hours of professional time required to bring about the changes in the behaviors of the father. Knute remains in school; there have been no further reports of "bizarre behavior." At termination of the program a conference was also arranged between the parents and a qualified child neurologist who agreed to work out a supervised program for withdrawing Knute from the medication he had been on since the age of three. The follow-up study will continue

while this is being done.

The H Family [6]

Harold was an eight year old boy referred by the school. He was reported to be very active, dangerously aggressive, and not achieving in school. He was deemed sufficiently disruptive to the usual classroom process that the school officials planned to exclude him from school if some dramatic changes in his behavior were not soon forthcoming. The principal's suggestion of treatment for Harold was met with reluctant acceptance by the parents only after the ultimatum regarding exclusion from school was made clear to them. The parents viewed Harold as a quiet, stubborn sort of social isolate who was rarely a serious behavior problem at home. While the mother was somewhat concerned about the difficulties in school, she habitually deferred to the wishes of the father who dismissed the importance of the school problem with comments to the effect that neither he nor his other sons had done particularly well in school. In fact, he seemed rather pleased at the level of skill reflected in his sons' aggressive behaviors. He did, however, agree to minimal participation in a treatment program if it would insure that Harold would not be excluded from school.

Harold was the fifth of six children, having four brothers and one older sister. The older boys in the family had also been conduct and behavior problems in school. The family lived on a small farm in a semi-rural area. The father was a part-time farmer and construction worker. The mother worked sporadically as a nurse's aide in a rest home. Neither parent had completed high school. The MMPI profile for the

mother was '2954:3:8 and for the father 4'91237-55:4:14.

Baseline observation in the home tended to corroborate the parents' report by showing very low rates of deviant behavior for all of the children. However, baseline observation in the classroom yielded high rates of such deviant behaviors as inappropriate noise and talking, non-attending, movement around the classroom and physical aggression. Observation during recess indicated that Harold spent a considerable percentage of this time either engaged in aggressive behavior (15 percent) or in solitary play (31 percent); only 54 percent of his time was taken up in group activities of any kind. Though Harold was in a third grade class he performed at the first grade level; he could read only a few words and do only very simple arithmetic problems. He could not reliably recognize the letters of the alphabet or numbers of two digits or more. His only "academic " interest seemed to be drawing, at which he exhibited some skill.

Intervention. The plans for a three stage program included the following: (1) increase the rate of Harold's attending behaviors, (2) increase his academic skills, (3) alter the pattern of aggressive-isolate behaviors.

E introduced the first stage by explaining to Harold and the class that he would be helped to learn to sit still and concentrate by a "magic work box." Further, they were told that the box would keep a count of points earned by Harold for attending and that at the end of the session the points could be traded in for candies which Harold would share with the class. Harold was told that the box (a simple buzzer and counter

activated by a remote control switch) would add up points only if he attended to the work assigned to him (drawing and copying numbers, initially). The details of this procedure are outlined in the report by Patterson, Ebner, and Shaw (1968) which also summarizes the results from a series of studies in which the procedure was applied to a variety of hyperactive children, including brain damaged, retarded and "emotionally disturbed."

Harold eagerly entered into the "game" and during the first session earned many candies and the spontaneous applause of his classmates when his accumulated points were announced. During six days of experimental sessions of twenty minutes each, Harold was moved from a 10 second fixed interval schedule to variable interval schedule ranging up to thirty seconds. As his behavior came under control the quality of his social interactions with his peers changed. His aggressive behaviors dropped to nearly a zero rate and the amount of social interaction increased. Because of these spontaneous changes, there was no need to introduce a program to change his interactions with peers.

The planning for stage two of developing competence in basic academic skills was facilitated by the increasing involvement of the school personnel. They were encouraged by Harold's changed behavior and assisted in collecting assignments of basic programmed materials in reading and arithmetic. These materials were used in a student-coach program. Each arithmetic problem was assigned a number of possible points based on the difficulty level. An above average student, whom Harold had chosen on several occasions to help distribute the

candy rewards, was selected as the student coach. The coach was equipped with problem answer sheets and a chromeplated counter for recording Harold's accumulated points. The student coach and Harold worked together for thirty minutes each day for one week. The coach was to oversee the completion of each problem. When a problem was completed he rewarded Harold with a smile and said, "Good." Points were also recorded on the counter for each correct solution. Incorrect problems were repeated, with help from the coach if necessary, until Harold arrived at the correct answer. Points were adjusted downward if more than one attempt was necessary to get the answer. At the end of each day's session, Harold's accumulated points were indicated in an announcement to the class by the coach and Harold filled in the appropriate amount on a "point thermometer" drawn conspicuously on the blackboard. A special candy reward was promised if the points "went over the top" of the thermometer at the end of the week. The reward was earned and accompanied by considerable peer reinforcement when it was shared with the class.

Since the program was succeeding and the school personnel had become more interested in Harold, it was decided that E should be phased out and control of the direction of the program and dispensing of rewards be turned over to the parents and the classroom teacher. The teacher was coached in the use of token rewards in the form of points for specific amounts of academic work beyond the arithmetic assignment and for increasingly long periods of time spent in appropriate rather than deviant classroom behaviors. Two cards were taped to Harold's desk. On one card the teacher marked each time interval (increased from fifteen minutes to

thirty minutes during the first few days of the program) during which Harold did not engage in disruptive behavior but did attend to his assigned work. A certain number of marks could then be traded in for a "free-time period" during which Harold could paint, listen to music or investigate science exhibits at the back of the room. The teacher found this system so uncomplicated and effective in the control of behavior that an observer doing a follow-up observation reported that every child in the class had a card on his desk and was diligently working for "free-time" points.

On the second card the teacher recorded points earned for completing assignments; a copy of this card was taken home each night and a total number of points was recorded by the mother. Harold's father agreed that when a specified criterion number was reached, Harold and his father would go on a fishing trip.

Harold was allowed to earn extra points for the fishing trip by explaining his daily school work to his parents after dinner. This was a difficult task since such topics were not typically an important part of the families' conversational repertoire. In a brief training session in the office the experimenters modelled some appropriate behaviors consisting of first asking Harold questions about what he had done in school and then attending closely (but non-critically) to his responses. A tape recorder was sent home with the parents with instructions to turn on the machine during each session in which the parents were practicing reinforcing Harold for talking about his school work. In two training sessions both parents demonstrated satisfactory skills.

The data in Figure 4 summarize the alterations in rate for deviant classroom behaviors. These behaviors included noise, movement around the room, non-attending, movement in chair, talking out of turn, and aggression directed toward peers. These data were collected during baseline, intervention and for a six month follow-up period. Comparable data were also collected in each session from randomly selected boys in the same classroom.

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Figure 4 about here

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The data show that Harold's rate of deviant behavior had dropped significantly (p less than .025) by termination of the intervention program. His average rate of deviant behavior during intervention and follow-up constituted a 64 percent reduction. While Harold's rate of deviant behavior during baseline had been significantly higher than that of his peers, at the conclusion of intervention it was comparable to theirs and in fact was usually lower. These intervention procedures cost 16 hours of professional time; much of that time was spent in conferences with the school personnel and the parents. The follow-up data demonstrate that the reductions were maintained over a six month follow-up period. Taken together, these data suggest that this indeed was efficient intervention.

One of the interesting aspects of this study lies in the "spontaneous" alterations in Harold's peer interaction. Similar changes had been noted in an earlier study in which the "work box" had been

employed; however, no data were collected which demonstrated that changes in peer interaction had actually occurred. Bricker (1967) has also noted such changes in peer interaction as a function of increasing the academic competency of the aggressive child. The observation data collected during recess describes the changes in quality of peer interactions for Harold.

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Figure 5 about here

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The data showed marked changes (p less than .005) in Harold's status as an "isolate." At recess during follow-up he was spending approximately 99 percent of his time interacting with other children on the playground. The data also showed marked reductions in the rate of hitting, shoving, and threatening other children.

In speculating about these changes, the writers assume that Harold has acquired a set of behaviors (attending, academic skills) which serve to reliably produce social reinforcers from the classroom environment. These behaviors take the place of the coercive-manding behaviors such as hitting, making noise, or moving about the classroom which had been his primary means of producing reliable social consequences in the past. The function of coercive-mands in producing social consequences has been outlined in the report by Patterson and Reid (1969). However, the present data provide only indirect support for these hypotheses; clearly the phenomenon of "spontaneous change" should be investigated.

The W Family

Walter was a ten year old boy referred by the Child Welfare Agency.

The mother listed an extensive catalog of complaints about Walter's behavior, including stealing, lying, excessive crying, noisiness, and persistent enuresis.

Besides Walter there were four other children: a six year old boy and girls aged four, three, and one. The mother and father had parted in a stormy divorce four years before and the family was currently supported by the Aid to Dependent Children Program. Mrs. W was twenty-nine, attractive, energetic, and had a high school education. Despite a fondness for young children she reported feeling trapped by the circumstances of poverty and the incessant pressure of coping with pre-schoolers without support from other adults. Her personality profile from the MMPI was 49'387(41)6:11:7.

Baseline observations in the home revealed that the highest rate of deviant behavior was to be found, not in Walter's behavior, but in his mother's. Although the enuresis did in fact exist, Walter's presumed massive output of "out of control" behaviors simply did not occur. Further checking on the reported incidents of stealing, for example, revealed that on occasion Walter had taken some cookies and that he had taken small change from his mother's purse and used it to buy candy. In describing Walter the mother invariably chose to maximize these events in weighting the various statements that she used to describe this boy. Many of the statements she used referred to low base rate behaviors that had in fact occurred at one time or another but were not necessarily descriptive of his general repertoire. For example, Walter was simply not "noisy" or "hyperactive" or "negativistic" which were terms she sometimes used to

describe his behavior. He actually exhibited no higher rates of out of control behaviors than did his siblings. His mean rate of .35 per minute was generally far below that of the other children referred to the project for out of control behaviors. He was in fact very cooperative and rather helpful in caring for his siblings.

The one person in the family who seemed to be behaving in a deviant fashion was the mother. She seemed to be the embodiment of her ancient prototype, Zanthippe. Her yelling, spanking, humiliating, and aversive commands occurred at an amazingly high rate of .91 responses per minute! While altering such mothering behaviors might have some preventative implications for Walter's later adjustment, it seemed to be an interesting problem in its own right. It was our impression that many of the families producing out of control children were characterized by angry, vituperative mothers who used primarily aversive stimuli to control the behavior of all of the family members. For these reasons, an attempt was made to design procedures for altering the child rearing behaviors of Mrs. W.

Intervention. Following the baseline period, Mrs. W was given the programmed text to read. As with the other cases, continuation of the intervention program was contingent upon her completion of the core of the text. The next step was to have Mrs. W observe Walter in the home, serving the dual purpose of teaching her to pinpoint behaviors such as non-compliance and bedwetting. One member of the staff spent time with Mrs. W during this phase to ascertain that she was acquiring skills in observing.

Following her observations, it was clear to Mrs. W that non-com-

pliance was a low base rate event; therefore, she expressed a preference for having us deal with Walter's enuresis as the first order of business. The mother's data showed that Walter was a multiple wetter, i.e. he wet several times in one night without awakening. An Enurotone was provided together with a system of points for dryness by which Walter could earn a model airplane.

While talking with Mrs. W about the enuresis program, we constantly were interrupted by the children. They stood quite near their mother simultaneously demanding her attention. They followed her about the house like miniature furies, while she frantically attempted to respond to all of their demands. We labeled the phenomenon the "gnat cloud," since the children were as thick, persistent, and annoying as the cloud of gnats which typically preceed a rainstorm in the tropics.

A series of programs were prepared which would serve both to train Mrs. W to use positive reinforcers to control child behaviors and at the same time to reduce the intensity of the "gnat cloud" phenomenon. As a first step the mother collected data on the frequency with which Walter stood within three feet of her. Two days of baseline data showed that the "proximity response" occurred about nine or ten times each day. The mother was then instructed to use such positive reinforcers as attending, touching, and smiling whenever the response occurred. Under this conditioning there was a greater than two-fold increase in proximity. On the tenth day the mother was instructed to discontinue the reinforcement and the behavior returned to baseline level.

To the experimenters, these data were a convincing demonstration

of the mother's prowess in shaping "proximity behaviors" and also indirect confirmation of her role in generating the "gnat cloud." However, the mother was little impressed with the demonstration and showed no change in her interactions with the children. The "gnat cloud" was omnipresent as was the full repertoire of aversive controlling techniques used by the mother. As a second step in the training program an attempt was made to train the mother to reinforce the children when they were not in close proximity to her. Games were set up for the children in their bedrooms (girls in one and boys in the other). M&M candies were made contingent upon playing alone for a few minutes. With the preschool age girls it was necessary to begin with the mother playing with them in their room and gradually fading her out while she reinforced their playing with one another.

After a short time the mother was able to merely provide verbal reinforcement (and an occasional M&M) from the doorway. Later, the girls were required to play on schedules of five to ten minutes. Although she was told to practice these contingencies during the day, it was apparent that the results were not generalizing in that the "gnat cloud" as well as her usual program of aversive control persisted. It seemed necessary to generate a more highly structured program.

For this phase a "mother box" was constructed which contained a collection of inexpensive materials such as clay, crayons, construction paper, pipe cleaners, and blunt nosed scissors. While Mrs. W fixed supper, a chair was placed across the kitchen door, and the children were informed that mother was not to be disturbed. Walter was assigned the role of art

instructor for the younger children. He distributed supplies and reinforcement to each child, under the tutelage of E. Walter and the children were told that if they were successful in not interrupting the mother for eight minutes they would earn a number of M&M candies. In each practice session the duration of the training period was increased up to thirty minutes. While the mother was pleased with this device and used it often as a means of turning off the "gnat cloud," the effects did not generalize to the extent of altering the "basic" patterns of interaction.

As a next attempt to produce generalized effects, the tape-feedback method used earlier with Knute's family was employed. However, again Mrs. W learned the technique but did not generalize her use of positive reinforcers to occasions other than those when the tape recorder was turned on.

To further accelerate the changes in her interaction patterns with the children a procedure was employed which was more expensive in terms of professional time but also one which ensured generalization. One of the staff would simply spend part of the morning following Mrs. W about the house as she interacted with the children. When a "gnat cloud" began to develop she was shown how to interact with, and reinforce, one child at a time. She was also shown how to attend more carefully to each of her children as they behaved reasonably or went about their chores. When she missed an opportunity to reinforce a child this was also pointed out to her. Four such training sessions were held, each consisting of one to two hours.

Figure 6 shows the effect of this series of programs in altering

the mothering behaviors of Mrs. W. One set of data show the changes in rate for such aversive consequences provided by the mother as yelling, physical punishment, humiliating, negativism, and ignoring. The second set of data indicate the changes in the rate of angry commands; these are requests which are stated in the form of implied threats.

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Figure 6 about here

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These data showed an impressive rate of aversive stimuli being dispensed by this mother. During the baseline period she dispensed an average of one such response every one or two minutes! The data for the last three months of intervention indicated approximately an 80 percent drop from this baseline level. This reduction in rate was achieved at a total cost of 29 hours of professional time. The data from the two month follow-up indicated that the results were holding well.

The parent who over-reacts to the behavior of his child or exaggerates the degree of deviancy is a regular occurrence at the child guidance clinic. Presumably one of the effects which the training programs produce for Mrs. W should be to train her to observe and label the behavior of her children more accurately. As an indirect measure of such changes Mrs. W was asked to describe Walter on a scale comprised of 47 bipolar items; this was done prior to and following intervention. The items were drawn from the factor analytic study by Becker (1960) using preschool children. The item pool was re-factored using a population of older children by Patterson and Fagot (1967). There were improvements

on the post-intervention ratings for four of the five factors. The mother saw Walter as being less tense, less withdrawn and hostile, intellectually more efficient, and displaying fewer conduct problems in the home.

One of the most interesting outcomes of this study was the apparent difficulty in altering mothering behavior. Other mothers involved in the project have demonstrated that it is possible to acquire these skills in only a fraction of the training time involved for Mrs. W. Although it is not as yet clear what the variables might be which differentiate among mothers, it does seem that one possible candidate is the inability to specify effective reinforcers for the new behaviors of mothers such as Mrs. W. Although it was possible to teach such mothers the technique, the effects of its application may not be all that reinforcing to the parent. In fact for Mrs. W it seemed that there was little social reinforcement being provided for her behavior. Young children do not seem to provide much reinforcement for the adults with whom they interact in any of the families we have observed. In effect, Mrs. W was required to turn out enormous quantities of mothering responses which were being maintained, not by positive reinforcement, but rather by aversive contingencies. It is our assumption that such an arrangement is a prime antecedent for an emotional state analogous to anger. The arrangement of extended responding under conditions of aversive control will increase the likelihood that the mother will apply similar contingencies in maintaining the behavior of the children. Presumably, there are many households of ADC mothers where no other adult is present

to support their behavior; and in such households one would likely find a mother whose behavior is controlled and she in turn is controlling primarily by aversive contingencies.

Both the frequent social reinforcers dispensed by the experimenters and the gradual reduction in the "gnat cloud" interactions probably functioned to strengthen the more positive mothering behaviors. However, because of our concern over the general lack of social reinforcement, arrangements were made at the close of the study for on-the-job training through the Welfare Department. Mrs. W is currently being trained as a typist; hopefully this will lead to increased interaction with a wider range of reinforcing dispensers than characterized her life in the past.

The K Family

Keith was a ten year old boy who had previously been enrolled in an engineered classroom. Although this experience had been effective in changing many of Keith's deviant classroom behaviors, the changes were not maintained when he moved back into a regular classroom setting. The parents also were increasingly concerned with his seeming inability to behave adaptively in either the home or school. Keith was described as a juvenile Machiavelli who skillfully manipulated adults. He kept his family in constant turmoil, making each mealtime a battleground. He flaunted his ability to get the rewards he wanted without concern for the usual family and school reinforcement contingencies. He was described by parents and teacher as immature, extremely negativistic, attention-demanding, easily distracted and hyperactive. He had few friends. Despite indications of greater-than-average intellectual ability

he was falling behind in his school work and bragging that the less work he did, the more attention he received.

Keith was the youngest of three children, having an adolescent brother and sister. Both siblings achieved at an academically superior level and were active socially. The family resided in an upper-middle to upper-class area. The father held an important administrative position in a local agency. Both parents were college graduates and active in community organizations. Both were eager to cooperate in producing some changes in their family. Neither parent seemed particularly deviant; this impression was corroborated by the MMPI profiles which were '3-172:18 and 647835:3:15 for the mother and father respectively.

Since there were both home and school problems, it was agreed that intervention would be begun in the home and that when the home programs were under control of the parents, an intervention program would be instituted in the school.

Intervention in the home. Following collection of baseline observation data both parents responded to the programmed text. In an office visit, they learned to pinpoint behaviors to be changed and learned procedures for keeping their own baseline count of those behaviors. Their first targets for change were failure to comply with reasonable requests, interruptions of others' conversations or activities, and yelling or making other loud noises. They were also to count the number of times Keith initiated a reasonable conversation and was ignored by some other family member. Both parents took turns counting these behaviors for one hour on each of three days. The older children were involved in counting

the number of times Keith's conversations were ignored by his parents; this led to their reading of the programmed text and later cooperation in the actual intervention procedures.

The family was informed that we would attempt to deal with just one problem at a time and then move on to the next one on the list. The overall intervention program took place in three stages: rewarding adaptive behavior and teaching Keith to recognize the occurrences of deviant behavior, teaching time-out procedures, and finally, using tape-training sessions to further modify the interaction patterns.

During the first stage, E went to the home equipped with a stopwatch and a supply of M&M candies. In a game-like atmosphere Keith was told that he could earn candy by simply complying immediately with usual and reasonable requests from his parents that he perform certain dinner-time tasks. He seemed very eager to participate. He actively complied with the requests made by his mother and even suggested a few short jobs he could do when his mother ran out of suggestions. They were then advised to set a regular half-hour practice period for the next morning with the understanding that the mother would keep a count of the points and hand out the rewards. Keith warned the assemblage that he would not do anything for which he did not receive points, thus realizing his parents' worst fears. They had repeatedly warned the experimenter that in such a program Keith would wind up the Onassis of the M&M market. However, his behavior did not match his words; that evening he cleared the dinner dishes from the table, despite the fact that the conditioning session was over and he received only a "Thank you."

On the second evening, the requirement was added that Keith could not yell or interrupt others during any thirty-second interval if he was to receive a point. Points were given only for intervals during which non-compliance, yelling and interruptions did not occur. When one of these did occur, that interval went by without reward. Again, Keith and mother held a practice session in the morning as he prepared to go to school.

During the next conditioning session, he was given a wristwatch-type counter and instructed in keeping a count of the number of times he yelled, interrupted or failed to comply with a request. This attempt at discrimination training was added because Keith had frequently protested E's credibility when a yell or an interruption was called to his attention. During home practice sessions, one other member of the family also wore a counter so they could validate one another's tallies. Other family members were also instructed to be alert to instances of reasonable attempts by Keith to converse without yelling or interrupting. If he was ignored on such an occasion, the behavior was labelled either by E or a family member, the ongoing conversation was stopped and time allowed for Keith to make his contribution to the interaction before others were allowed to resume talking. Keith, of course, was eager to point out these transgressions on the part of others. Practice sessions were held by the family (without E) each morning and evening.

During the next stage of the program, the parents were taught to use the time-out procedure as a consequence for such deviant behaviors as swearing, making loud competing noises during the siblings' music

practice sessions, and whining when requests were not granted. When one of these behaviors occurred, it was first labelled and then Keith was taken to the time-out room where he remained for five minutes. Despite his protestations that "This won't work!" his parents reported that time-out produced a rapid decrease in the frequency of the specified behaviors. It might be added that the parents were reluctant to apply time-out as a contingency. They also initially confounded its effectiveness by engaging in long debates about the nature of the offense.

The third stage of the intervention program was designed to deal with the parents' complaints that Keith continued to engage in subtle "bugging" operations which did not really fall into any of the more obvious deviant behavior categories used up to that point. In order to better operationalize the "bugging" and "needling" behaviors, the family was provided with a tape recorder and asked to record family interaction for an hour each evening. The parents then brought the tapes into the office and listened to a playback interaction with E. With this data in hand Keith's verbal manipulations became clear; he was especially adept at changing the subject and drawing others into long, irrelevant discussions of tangential topics. This seemed to occur with greatest frequency just after Keith had been asked to complete a task. During these debates the mother's voice quality changed significantly and she reported feeling very angry. In addition to Keith's guerrilla tactic of delay and distract, both parents tended to assign tasks without specification (or agreement between themselves) as to the consequences for non-compliance.

The parents and E decided, after listening to several taped hours of interaction, to initiate a program of ignoring Keith's attempts to debate requests, specifying the time allowable for the completion of each assigned task and the consequences for not completing the task within those time limits (generally time-out). They were also taught to cease their endless cataloging of Keith's previous failures to comply and to supply positive social reinforcers for successful completion of tasks. Previously they had tended to use a "yes-but" reinforcer; for example, "Yes, you did clean the dishes today, but last week you forgot." Monitoring several hours of taped interaction proved to be an effective training device for altering these contingencies.

As shown in Figure 7, Keith's rate of deviant behavior in the home dropped 75 percent from the average baseline level, an effect which is significant at the .0001 level. This reduction in the rate of deviant

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Figure 7 about here

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behavior required a professional time expenditure of 16 hours. Analysis of three months of follow-up data showed that these effects are being maintained.

School intervention. When it was clear that the parents were cooperating in carrying out the programs in the home, a program was initiated in the classroom. Baseline observation indicated that Keith's overall rate of deviant behaviors was approximately four times that of his peers. Keith was described as easily distracted, active in moving

about the room and talking out. He frequently teased others and appeared to have few friendly social interactions. In a sociometric assessment, Keith was the only child in the class to receive no choices as a possible partner for a social studies project. Despite reportedly above-average intellectual ability, Keith was behind in classroom work in reading, spelling and arithmetic.

In order to maximize the impact of the peer group in producing and maintaining behavior change, a point system was designed with points exchangeable for extra recess time, a baseball game, special films and an end-of-the-year party for the class. Keith also earned points to buy time to talk alone with his teacher. A program was worked out with the parents so that his completing catch-up spelling at home and doing extra curricular reading earned points which were accumulated over a two month period of time to buy a microscope.

Immediately after the baseline observation period, the teacher was given a copy of the programmed text. Following this, the actual classroom conditioning procedures were initiated. The conditioning was carried out marathon-style with the Es working in shifts for several hours each day. The program began with conditioning of attending behavior. This part of the program was similar to that designed for Harold in that Keith was required to attend to some desk work for increasingly long periods of time. He was rewarded by points accumulated on the "work box;" by earlier agreement these points were exchangeable for extra recess time (or other back-up reinforcers) for Keith and his classmates. Later in the conditioning sessions, he was required to

attend at his desk without the device for increasingly long periods of time in order to earn the right to work for points. Eventually he was working for long periods of time without the box in order to earn a few minutes of box time. This arrangement has been described in a report by Patterson et al (1968).

Early in the program, a time-out procedure was instituted as a consequence for talking out and moving about the classroom during periods of individual work. When either of these two events occurred, Keith was taken by E down the hall to a time-out room where he remained alone for five minutes. He was then returned to his classroom to study. As his attention span increased, completion of academic work was gradually substituted as the criterion behavior. Points earned for academic work were applied to earning "academic" rewards such as Friday afternoon viewings of nature films for the entire classroom. Keith also exchanged points for time to spend alone with the teacher discussing science projects (a newly intensified academic interest).

The program was a success as shown both by observation data and by the teacher's report that he was catching up in his classwork and seemed to be showing interest. At this point, the marathon point-keeping behavior of E was phased out, and the teacher was taught to record points on a hand-counter during three randomly selected one-half hour periods per day. Since Keith could not tell when she was keeping the points, and since the total was not announced until the end of the day, it was necessary that he consistently attend to his work and avoid deviant behaviors which might cause him to be placed in time-out.

The homework program was begun which allowed Keith to earn extra points by studying spelling or reading at home each night with some member of the family. These sessions were taped and used to train the parents who still tended to supply a high rate of "Yes-but" reinforcers for academic achievement. These points were also applied to the purchase of the microscope which could be used for school and home science projects. As part of a program to train the parents to be more reinforcing for academic behavior, Keith's mother came to the classroom and was taught to observe and to keep a record of points. These points were applied to an end-of-school ice cream party supplied for the entire class by Keith and his mother.

The data in Figure 8 describe the changes in the rate of occurrence of the same out of control behaviors previously presented for Harold. These data were collected on occasions when the "work box" was not being used; the data thus constitute a rough index of the generalization of conditioning effects. Data are provided both for Keith and for randomly selected peers.

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Figure 8 about here

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It is of interest to note that there was a moderate decrease in the rate of deviant behavior for Keith following the teacher's reading the textbook and applying some of the principles. She indicated that as a result of reading the book, she had been ignoring Keith's deviant behaviors and rewarding appropriate behaviors. His rate of deviant

behavior in the last month of intervention was 78 percent lower than his average level during baseline, an effect which is significant at the .05 level. Generalization of the effects of the academic program was illustrated by his math teacher (math was taught in another room by another teacher who did not know about the intervention program) who asked, "What happened to Keith? He suddenly decided to catch-up on all his math and now he's ahead."

This decrease in deviant behaviors and dramatic change in academic achievement was accomplished in 32 hours of professional intervention time, including actual engineering time in the classroom, as well as conference time spent by the mother, the teacher and the various Es.

## Discussion

It was the intention of the authors to describe the evolution of a technology for working with families who had problem children. Naturally, each of the first few families required the construction of tailor-made procedures to fit that particular child and family. However, in working with the families currently involved it is clear that the procedures developed earlier can handle many of the problems for which these new families are referred. However, it is still true that each family requires the construction of <u>at least one new technique</u>. While the principles on which the new techniques are based remain the same (reinforcement theory), the fact that new techniques must still be devised suggests that we are far from being at the "cookbook stage."

At this early juncture, it is perhaps premature to speak of "success rates" or "efficiency" in considering the family intervention

techniques which are currently appearing in the literature. However, some preliminary consideration should be given these topics for the enterprise is fast approaching the point where these in fact will be major considerations.

An examination of success rates for the families involved in the project over the last few years is very revealing. By one set of criteria even the very earliest efforts were greeted with startling success. Observation data collected from three families involved prior to 1967 showed that in all cases significant changes were produced in the behavior of the children and, in some instances, the behavior of the parent. In two of the families, these rapid changes were produced at an investment of clinical time considerably less than ten hours. However a casual follow-up of the three families showed that only one of the families seemed to have maintained the gains for more than a few months. Interestingly enough, the family that seemed most successful six months after termination was the family that had presented the most "severely disturbed child" and the one in which we had invested many hours in training the parents (Patterson et al, 1967). These impressions, based upon fragments of data, would suggest that the criteria "success at termination" and "success at follow-up" may be somewhat unrelated estimates of outcome. Because these early studies did not include follow-up designs, most of the data were not usable.

In 1967, at the beginning of the current project, two families were trained with the same procedures developed the year before. These procedures included having the parent read the programmed text, E's

modelling the technique and briefly supervising the parents, and termination when the child's behavior had changed. Neither of these families required ten full hours of clinical investment; but the three month follow-up data indicated that already many of the gains in the home had been lost. It seemed likely that the outcome of the earlier training programs had been highly specific in that the parents had been trained to alter one or two specific child behaviors but they were still not well practiced in application as a matter of routine parent-child interaction. What was required, then, was a more systematic training program for the parents.

Part of the success at follow-up will hinge upon the ability of the professional to train the family in the use of general intervention strategies for handling new problems as they arise or in handling minor increases in rate for the previous problem behaviors. The latter point is of some import, because many of the deviant child behaviors do not drop to zero, but continue along at a markedly reduced rate, e.g. the child has a temper tantrum about once a month instead of three times a day. Given some occasion when the mother is momentarily distracted she might find herself reinforcing the temper tantrum; a sequence of several such fortuitous events could produce a slight increase in rate for these behaviors. At this point it would be important for the mother to sit down and work out a program to bring this behavior under control again.

We have been particularly impressed with the problems involved in teaching families to reach this level of sophistication in handling problems. For example, all of the parents read the textbook on social

learning at an early stage in their training. However, few of them have been able to proceed from that exposure to the development of their own programs in altering child behavior. Knute's family seemed to be such an exception. For most, even after they have actually participated in observing, counting and altering one or two child behaviors, they have great difficulty in designing and carrying out their own programs. Even if capable, they tend not to do so unless prompted. As we have only recently become aware of this phenomenon we have collected no data nor, as yet, taken steps to alter the training programs, but it would seem crucial that this be done. For example, it might be required that each family, as a kind of graduation exercise, successfully pinpoint a problem, collect observation data and design and carry out their own intervention program. Presumably such a process would increase the survival value of the training program for that family.

The requirement for more systematic training leads to an increase in the number of training sessions for the parent, telephone supervision, training the parent to observe, and the tape training procedures. Although the techniques evolved only gradually each of them necessitated additional investments of clinical time. For example, the families of Walter and Knute required thirty some hours of professional time. For the five families involved in these more systematic training procedures, the intervention and three month follow-up data indicated one hundred percent success. The observation data collected in the school also showed that the effects of the classroom intervention programs were holding up. Six month follow-up data on two home intervention cases

(Russ and Knute) and one school intervention case (Harold) indicate that the effects were maintained.

It seems that the follow-up data are the criteria which are necessary in evaluating the utility of classroom and family intervention programs. It is unfortunate in that regard that most of the current behavior modification literature neglects to provide such data. By the same token, it seems important for social engineers not only to assess the relative permanence of their efforts but also to provide data describing the amount of time required as an investment to produce these effects. Intervention effects which do not persist are of interest, but have little utility. Intervention effects which persist but cost inordinate amounts of professional time may also have little utility when considering cost.

In considering the utility of family intervention procedures, it is important to consider the restrictions in cases sampled thus far. In our own investigations over the past three years, we have not accepted families in which one of the members was diagnosed autistic or schizophrenic; nor have we attempted to work with severely brain damaged or retarded children. In only a few of the cases completed thus far would the parents be described as severe character disorders, or culturally deprived. It is of interest to note in this regard that the one recent family whose follow-up data showed our best efforts to be of no avail was a family in which the children and parents were retarded and living in circumstances that could well be described as "culturally deprived."

These ommissions in sampling suggest several things. For one, it is likely that increasing the range of cases will undoubtedly require

further innovations in technology; but, at the same time, such increases in scope will bring behavior modification techniques that are much closer to fulfilling the needs of the clinician practicing in outpatient facilities. For the present, the existing techniques meet only a small portion of the problems confronting the clinician. If we require replications before offering the techniques to the clinicians as "possibilities" then the list is unpretentious indeed. However, the general concepts and the data collecting strategies upon which the behavior modification enterprise is being constructed constitute a promising set of operations for building a viable social engineering technology.

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## Footnotes

1. An earlier version of this paper was presented at the convention of the American Psychological Association, San Francisco, September, 1968.

This project was supported by PHS 13330-01 and 02 (GRP) and MH-38, 125-02 (DS). The writers wish to acknowledge the contributions of J. Reid to the earlier stages of development of the hypotheses and clinical procedures. They also wish to acknowledge a more contemporary debt to the team of observers and data tabulators whose efficient functioning contributed so much to the development of the overall project: Terry Shaw, Jo McDowell, and Donna Sundberg.

2. Most of the innovations occurred in response to problems encountered in working with the first two families. The parents and the observation data agreed in indicating that the behavior of these two deviant children had been altered as a result of only nine hours of professional time invested in each of the family interventions. However, the two pilot studies cannot be considered as "successes," in that the six month follow-up data showed that while the effects persisted in the school, the family intervention programs did not hold up for either of the families. This comparative lack of success led to the development of the more systematic procedures which are described in the present study.

3. This method of sharing the largesse was introduced as a crude method of initiating sibling social reinforcers as an added support for John's behavior. A similar technique has been used in the classroom procedures. As yet no data have been collected which make it

possible to evaluate the technique. It is our impression that it may be of particular importance to initiate such a procedure when working with families in which young siblings are present in order to reduce the probability that they will attack him because of his "earnings."

4. The writers are indebted to O. Lindsley and other members of the Kansas group for such procedural innovations as pinpointing, the use of the wrist-counter and the emphasis upon training parents to observe.

5. A complete neurological examination at our request yeilded essentially negative findings.

6. The next family in the series actually concerned a nine year old retarded boy who set fires and was isolated and attacked by his peer group. The procedures designed to work with this culturally deprived family have been detailed elsewhere (Patterson & Reid, 1969). The observation data collected at home and in the school indicated that the family and peer group had effectively altered his behavior. However, after a three month follow-up, the family refused to allow further observations. During the next three months there is good reason to believe that the effects of both programs were lost. We are currently negotiating with the family to initiate a new series of observations and intervention programs at both the home and school. However, by the criteria which we apply to our work, this case should be counted as a "failure," in that the effects did not persist through the six month follow-up period.

FIGURE 1

JOHN 1967 RATE OF DEVIANT BEHAVIOR

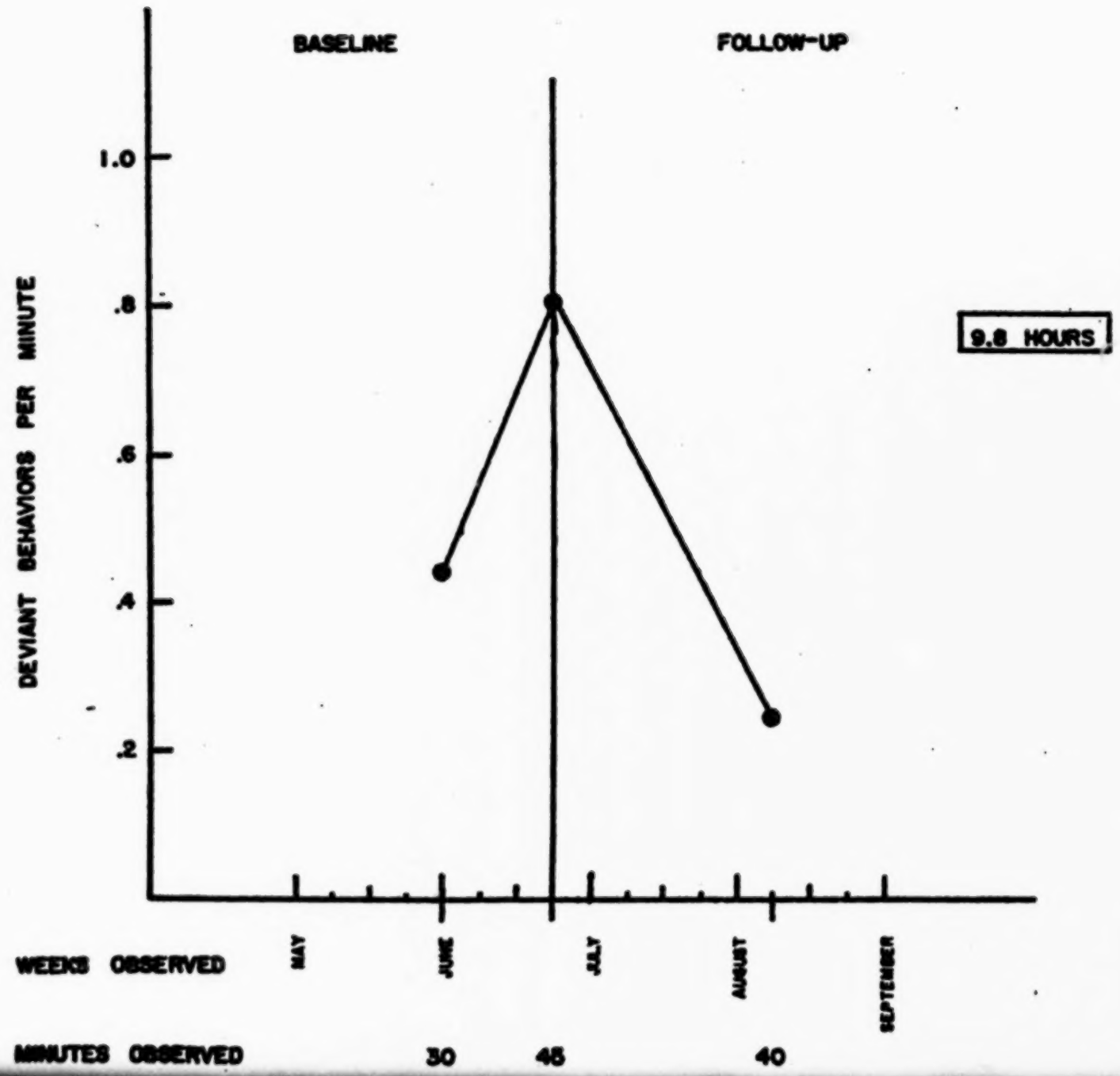

FIGURE 2

RUSS 1967 RATE OF DEVIANT BEHAVIOR

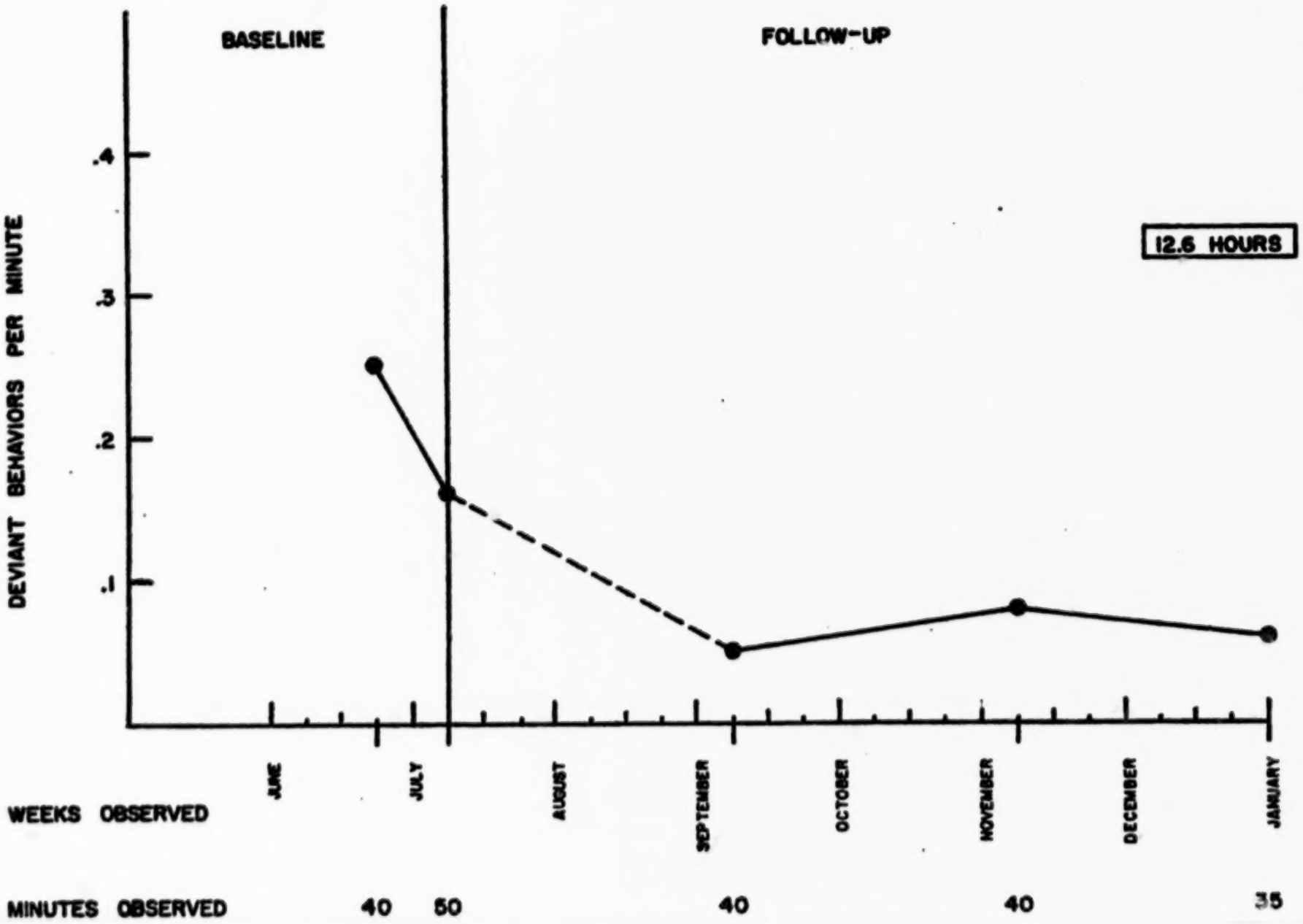

FIGURE 3

KNUTE 1967 RATE OF DEVIANT BEHAVIOR

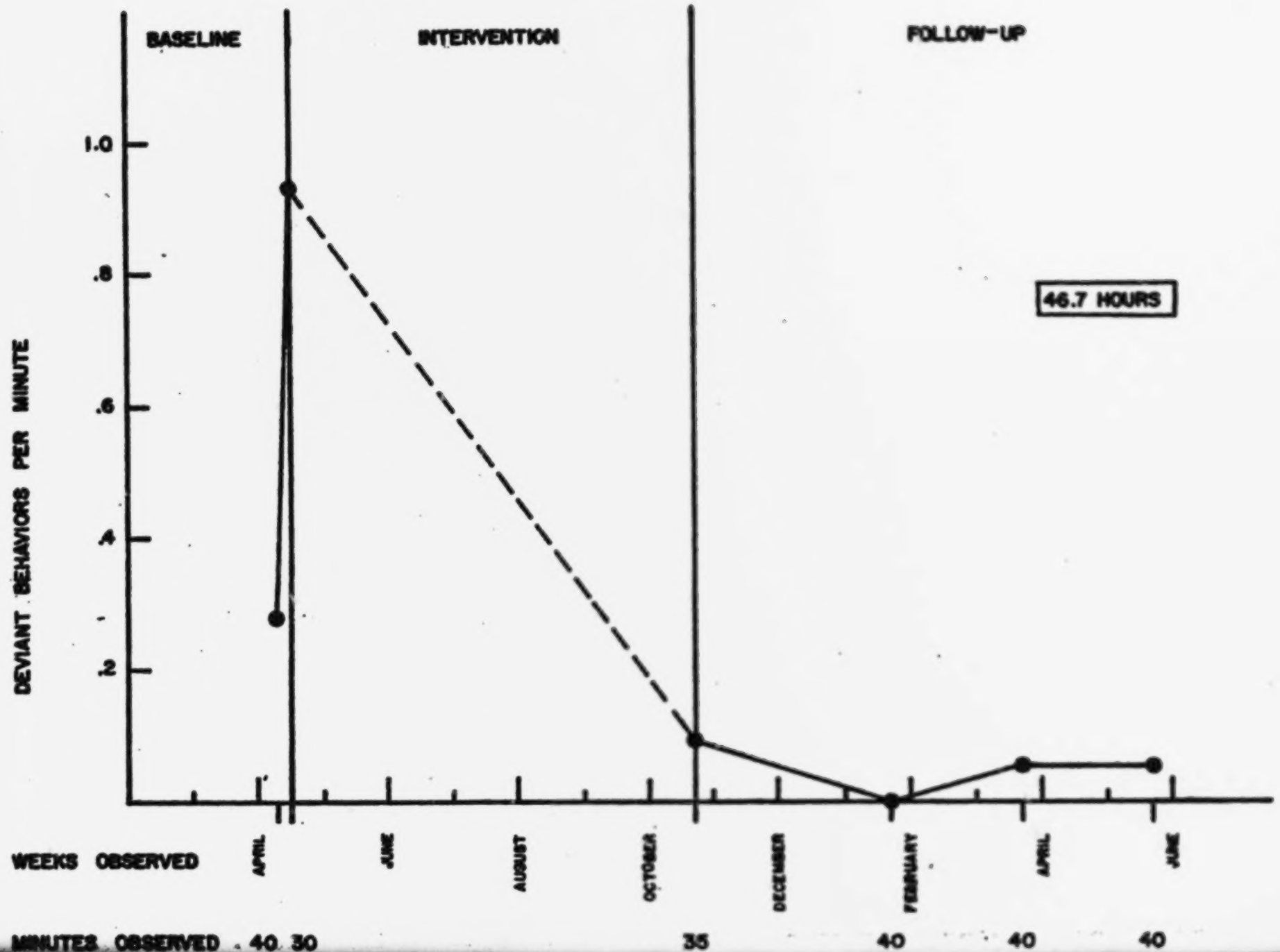

FIGURE 4

## RATE OF DEVIANT BEHAVIOR IN THE CLASSROOM

## HAROLD AND HIS "AVERAGE" PEER

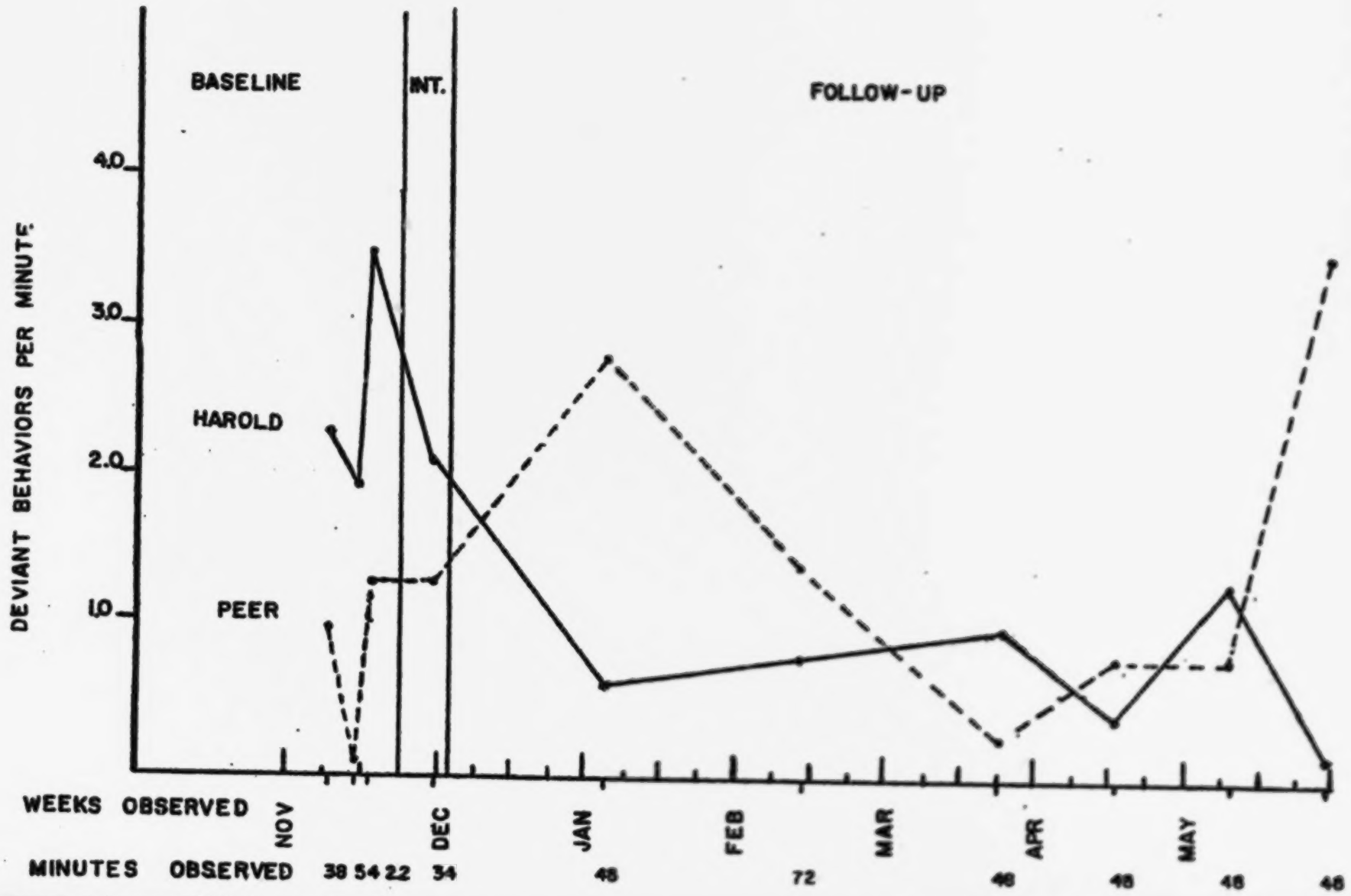

FIGURE 5

## PEER INTERACTION AT RECESS FOR HAROLD

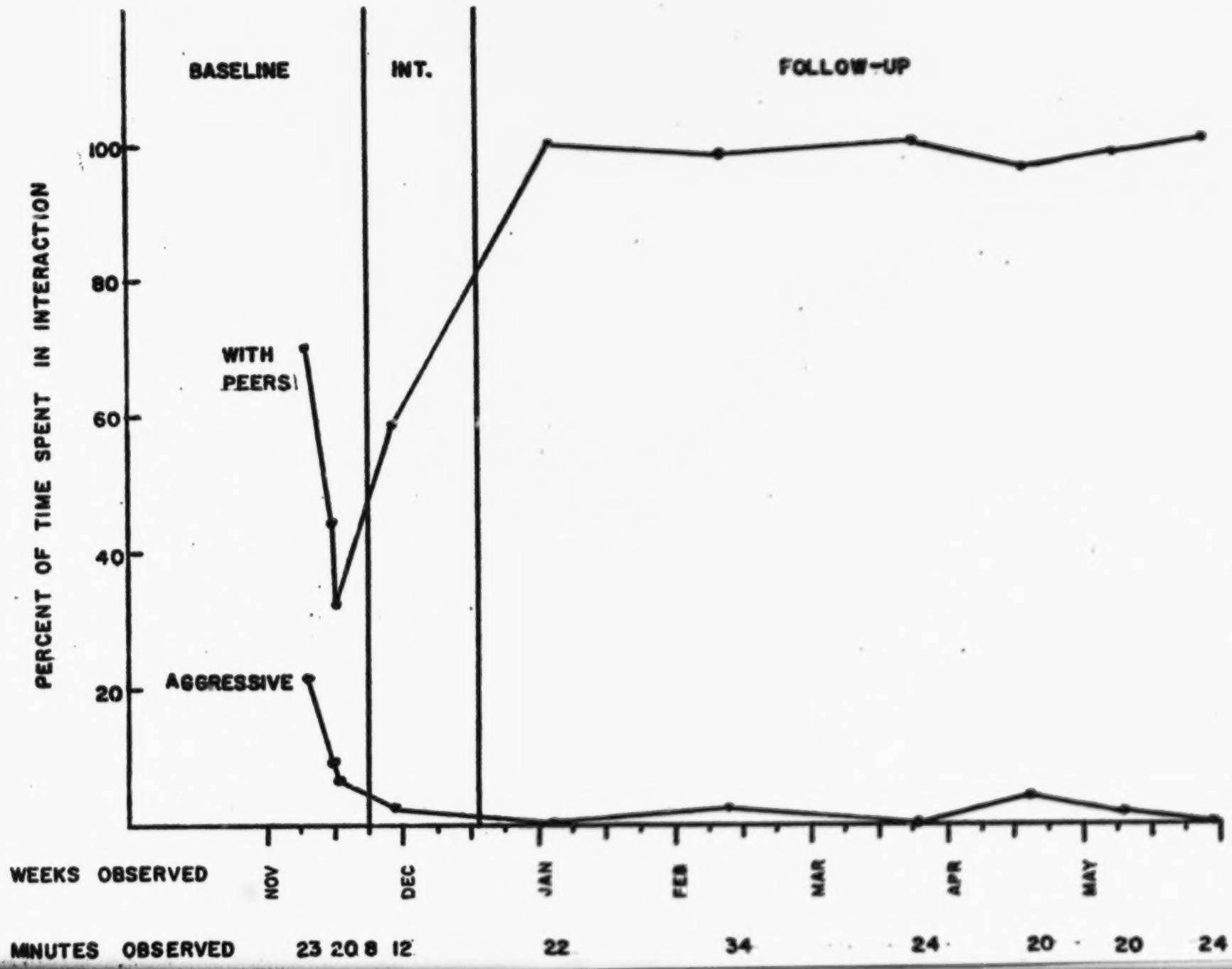

FIGURE 6

# THE "XANTIPPHE" SYNDROME

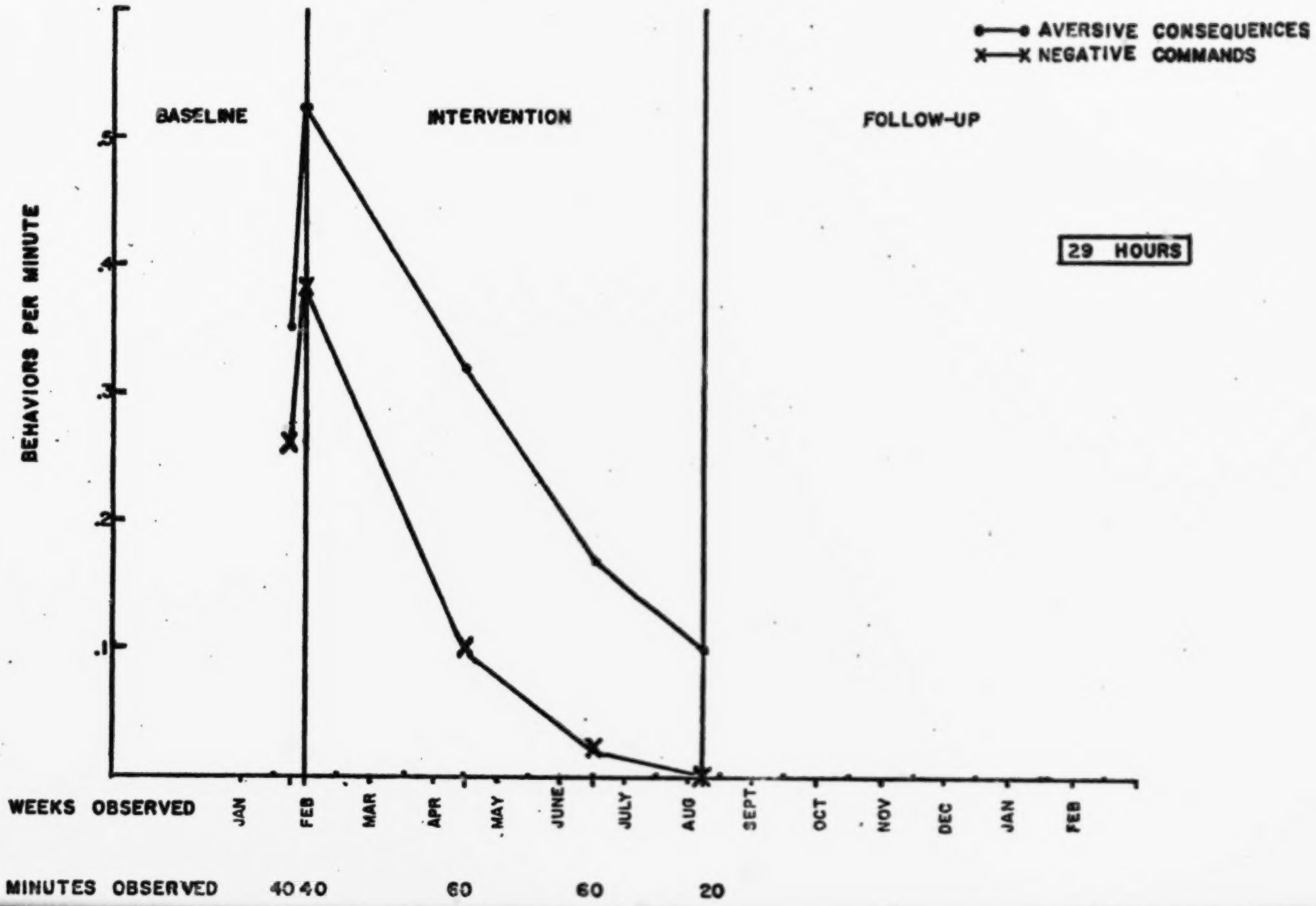

FIGURE 7

## RATE OF KEITHS DEVIANT BEHAVIOR IN THE HOME

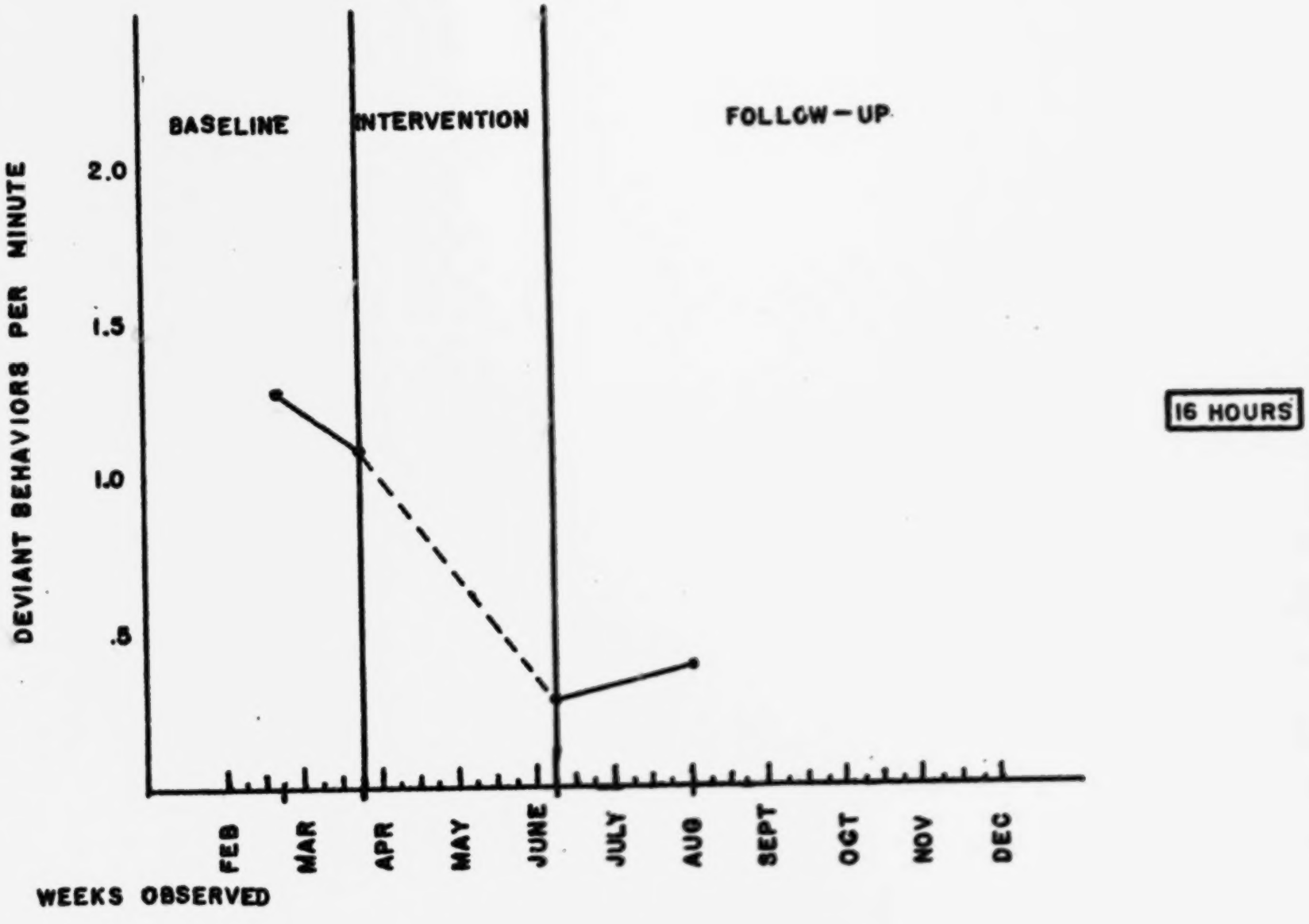

FIGURE 8

## RATE OF KEITH'S OUT OF CONTROL BEHAVIORS IN THE CLASSROOM